IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

ADAPTIX, INC.	§	
	§	
v.	§	**CASE NO. 6:12-cv-22**
	§	
ALCATEL-LUCENT USA, INC. , ET AL.	§	

ADAPTIX, INC.	§	
	§	
v.	§	**CASE NO. 6:12-cv-122**
	§	
ALCATEL-LUCENT USA, INC. , ET AL.	§	

ADAPTIX, INC.	§	
	§	
v.	§	**CASE NO. 6:12-cv-123**
	§	
ALCATEL-LUCENT USA, INC. , ET AL.	§	

ADAPTIX, INC.	§	
	§	
v.	§	**CASE NO. 6:13-cv-49**
	§	
ERICSSON INC., ET AL.	§	

ADAPTIX, INC.	§	
	§	
v.	§	**CASE NO. 6:13-cv-50**
	§	
ERICSSON INC., ET AL.	§	

ADAPTIX, INC.	§	
	§	
v.	§	**CASE NO. 6:12-cv-369**
	§	
T-MOBILE USA, INC.	§	

DEFENDANTS' SUR-REPLY CLAIM CONSTRUCTION BRIEF

In its reply brief, Adaptix mischaracterizes two references (the *Shad* reference and the *Farsakh* '237 Patent) attempting to support its construction for the "spatial signature" claim terms in the '808 Patent. *See* Rep. Br. at 13-15. Adaptix never identified either of these references in its 4-3 statement or its opening claim construction brief. Recognizing that sur-reply briefs are submitted only in limited circumstances, Defendants respectfully submit this sur-reply brief to address Adaptix's mischaracterizations of these previously uncited references.

A. Adaptix makes multiple incorrect statements about the teachings of *Shad*.

As Defendants showed in their responsive briefing, a "spatial signature" recited in the '808 Patent means the relative complex gains of transmitted signals received by an antenna array. Defs.' Br. at 32-39. Importantly, the spatial signature of a *subscriber* (the claimed phrase) is different than the spatial signature of a *base station*. As used in the art and in the '808 Patent, the spatial signature *of a subscriber* results from the signal transmitted by the subscriber and received by the base station, and the spatial signature of a base station results from the signal transmitted from a base station and received by the subscriber. *Id.* at 41-43. It follows then, that the base station's *receiving* antennas are the antennas relevant to the *subscriber's* spatial signatures (which is the disputed term in the patent). Adaptix misreads *Shad* to say that instead the *transmitting* antennas are the ones relevant to the subscriber's spatial signature.

The confusion stems from the word "station" in the *Shad* reference. *Shad* discusses "portable stations" and "basestations," which mean subscribers and base stations, respectively. *Shad* sometimes refers to "portable stations" as "mobile stations" or just shortens "portable stations" to "stations." Rep. Br., Ex. 19, at 868, Abstract ("In this paper we consider the capacity of a set of *portable stations* sharing a single indoor radio channel. The *stations* communicate with a *basestation* which is equipped with a smart antenna) and *id.* at Introduction (first sentence) ("In many wireless systems, *mobile stations* communicate through a *basestation* which is attached to a wired network."). Regardless, it is clear that when *Shad* says "station," it is referring to the entity communicating with the base station, not the base station itself. Therefore,

when *Shad* discusses "station signatures," it is referring to signatures of subscribers, which is the disputed term in the '808 patent.

Adaptix argues the opposite—that when *Shad* discusses "station signatures" it is describing the *transmitting antennas* of a basestation. *See* Rep. Br. at 14 ("This information is provided for each base station antenna."). But as discussed above, "station signatures" means subscriber signatures. Further, the transmitting antennas of a base station are related to the base station's signatures, not the subscriber's. It is the base station's *receiving* antennas that would be used to measure the subscribers' spatial signatures. Def. Br. at 41-43. The description of "station signatures" in *Shad* refers to *subscribers* and is entirely consistent with both the specification of the '808 patent and Defendants' construction. *Compare* Rep. Br., Ex. 19, at 869 *with* '808 Patent at 5:10-12. Adaptix's argument that *Shad* describes base station signatures and that those signatures are relevant to the claim term at issue – subscriber signatures – is meritless.

Second, Adaptix argues that Defendants' construction of "spatial signatures" is incorrect because *Shad* describes spatial signatures that may be formed from multiple vectors. This argument is, again, based on a clear misreading of *Shad.* As described in *Shad*, the spatial signatures of subscribers are represented as vectors "v." The subscript following the vector "v" indicates which subscriber the vector describes. Thus, v_d is the spatial signature of the "desired" subscriber, while v_i is the spatial signature of the i^{th} "interfering" subscriber. Rep. Br., Ex. 19, at 869. Adaptix appears to believe that the unique spatial signature vectors just described are both describing a single subscriber in *Shad*, and that therefore the spatial signatures may be more complex than construed by Defendants. As described, Adaptix misreads the plain language of *Shad*. v_d is the spatial signature of the "desired" subscriber and v_i is the spatial signature of the interfering subscribers. These spatial signature vectors represent different subscribers and therefore cannot, as Adaptix argues, show that spatial signatures come in various forms.

Last, Adaptix suggests that the spatial signatures described by *Shad* do not include "relative complex gains between the base station antennas." Rep. Br. at 14-15. But this is *directly contrary* to the disclosure in *Shad.* *Shad* repeatedly describes the components of the

spatial signatures as complex. Rep. Br., Ex. 19, at 870 ("As a result, the components of each received station signature vector, v_d are independent ***complex*** Gaussian variates.") *see also id.* at 871 (describing station signatures as "***complex*** vector signatures").

B. Adaptix misrepresents the teachings of *Farsakh*.

Adaptix contends that a spatial signature may be represented in terms of a "spatial covariance matrix" disclosed in *Farsakh*. Because of this relationship, Adaptix appears to argue that Defendants' construction of spatial signature must include or be consistent with a spatial covariance matrix. Rep. Br. at 14. This argument fails as a matter of simple logic – a spatial covariance matrix is not a spatial signature, so it matters not whether Defendants' construction is in harmony with it. A spatial signature and spatial covariance matrix are shown in equation (7).

An anticipated value can thus be determined for the spatial covariance matrix

$$C_k = \sum_{q1=1}^{Qk} \sum_{q2=1}^{Qk} \breve{a}_{kq1} \breve{a}_{kq1}^{H} \breve{b}_{kq1}^{*} \breve{b}_{kq2} = r_k r_k^{H} \qquad (7)$$

whereby r_k indicates a spatial signature for a communication connection k, k=1 . . . K.

The spatial covariance matrix described by *Farsakh* is denoted by the symbol C_k, while the spatial signature is denoted by the symbol r_k. Rep. Br. at 14. The relationship between C_k and r_k is $C_k = r_k r_k^H$. At this point, it is clear that the spatial signature (r_k) is not the same as the spatial covariance matrix (C_k) and that Adaptix's argument must fail. To explain the equation further, the superscript H is a linear algebra symbol denoting a matrix operation on complex matrices called a conjugate transpose.[1] A conjugate transpose requires transposing the matrix and then taking the complex conjugate of each entry. A spatial covariance matrix then, according to *Farsakh*, is obtained by multiplying the spatial signature vector by its complex conjugate transpose.[2] The spatial signature is used to calculate the spatial covariance matrix, but this does not imply, as Adaptix assumes, that they are equivalent or that a construction of spatial signatures must also be a construction for spatial covariance matrix.

[1] *See, e.g.*, Wolfram Mathworld, Conjugate Transpose, http://mathworld.wolfram.com/ConjugateTranspose.html; Wikipedia, Conjugate Transpose, http://en.wikipedia.org/wiki/Conjugate_transpose.
[2] The fact that a vector has a *complex* conjugate transpose necessarily means that it includes *complex* numbers.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that on the 15th day of January, 2014, all counsel of record were served with a copy of this document via the Court's electronic case filing system.

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